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EXAMINER	
SLAWSKI, BRIAN R	
ART UNIT	PAPER NUMBER
4191	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/560,180	BOLOGNESE, LITTERIO	
	Examiner	Art Unit	
	BRIAN R. SLAWSKI	4191	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/09/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

PROCESS FOR THE PRODUCTION OF A CURVED LAMINATED GLASS PANE

Examiner: Slawski S.N.: 10/560,180 Art Unit: 4191 January 9, 2007

Claim Rejections—35 USC §103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 17, 18, and 27-31 are rejected under 35 USC 103(a) as being unpatentable over Kavanagh et al. (WO 91/19586) in view of Balduin et al. (US 2001/0007270), and further in view of Mattimoe et al. (US 3,900,673).

Regarding Claim 17, Kavanagh et al. teach a process for forming a curved laminated glass pane comprising first and second glass sheets, together with an interlayer having at least one biaxially oriented thermoplastic carrier layer and at least one layer of polyvinyl butyral bonding resin (Abstract; p. 1, L. 14-23; p. 4, L. 9-12). The process comprises: thermoforming the interlayer **70** on a mold **26** having the end shape of the laminated glass pane (Fig. 3; p. 10, L. 35-37; p. 11, L. 5-11; 24-32); and positioning the interlayer between two curved glass sheets and laminating the assembly under heat and pressure (p. 12, L. 8-23).

Kavanagh et al. teach preheating and prestretching the interlayer **70** upon the mold **26** before thermoforming, i.e. before further raising the temperature to achieve

heat setting (Fig. 3; p. 10, L. 16-27, L. 35-37; p. 11, L. 1, L. 5-11). Kavanagh et al. further teach cooling the interlayer after thermoforming and before subsequent lamination (p. 11, L. 16-18). However, Kavanagh et al. teach only radiant heating and cooling within stagnant chamber **32** (Fig. 3; p. 14, L. 3-9, L. 29-37; p. 15, L. 1, L. 9-13) and do not teach the use of a hot-air jet to effect said preheating, nor cooling by forced draft.

Balduin et al. teach a process of producing laminates comprising two sheets of glass together with a plastic adhesive interlayer [0001]-[0002]. Before lamination, pre-forms **1** of said glass sheets and interlayer are preheated in a heating chamber **7**, using either radiant or convective means (Fig. 1; [0032]). Balduin et al. futher teach that, in a similarly heated subsequent pressing chamber **9**, a hot-air blower is a suitable heating means [0033]. (While Balduin et al. do not teach such a heating method applied to the interlayer before thermoforming, one skilled in the art would have recognized the disclosed hot-air blower as an effective means of heating the interlayer at any stage.) Balduin et al. thus teach that a radiant heater and a hot-air blower are considered functionally equivalent heating methods. Therefore, it would have been obvious to one of ordinary skill in the art to substitute a hot-air jet for the radiant heater disclosed by Kavanagh et al.

Furthermore, Mattimoe et al. likewise teach a method of producing a laminated glass pane comprising two glass sheets **12**, **13** together with an interlayer **14** of polyvinyl butyral resin (Fig. 3; col. 4, L. 24-46). Said laminate also includes a protective covering **15** comprising a layer of polyethylene terephthalate and a layer of polyvinyl

butyral (col. 4, L. 47-49, L. 55-57; col. 5, L. 36-42). Mattimoe et al. teach cooling said polyethylene terephthalate film after its heat setting (i.e. thermoforming) via impinging air (col. 8, L. 35-39, L. 50-55, L. 62-65). Thus it would have been obvious to one having ordinary skill in the art to use forced draft during the post-thermoforming cooling disclosed by Kavanagh et al., because Mattimoe et al. teach impinging air as an effective means of cooling the plastic layers of a safety-glass laminate.

Regarding Claim 18, Kavanagh et al. teach an interlayer comprising two bonding resin layers **14**, **16**, intended to contact distinct glass sheets, each adhered to opposite sides of a functional layer comprising carrier layer **12** and performance-enhancing layer **18** (Fig. 1; p. 2, L. 6-9; p. 5, L. 20-36; p. 6, L. 11-13).

Regarding Claim 27, Kavanagh et al. teach polyvinyl butyral as the bonding resin (p. 5, L. 32-36).

Regarding Claims 28 and 29, Kavanagh et al. teach forming a glass pane of a spherical shape generally in the form of a watchglass, having a cross curvature of 4.1 cm [41 mm] and a radius of curvature of 33.0 cm [330 mm] (p. 14, L. 9-20).

Regarding Claim 30, Kavanagh et al. teach a functional layer comprising a polyethylene terephthalate film adhered to one or more performance-enhancing layers, e.g. a solar reflecting mirror (p. 1, L. 28-34; p. 2, L. 6-16).

Regarding Claim 31, Kavanagh et al. teach thermoforming at a temperature of 130°C (p. 14, L. 26-36; p. 15, L. 1-7).

3. Claims 19, 22-25, and 36 are rejected under 35 USC 103(a) as being unpatentable over Kavanagh et al., Balduin et al., and Mattimoe et al. as applied to Claims 17, 18, and 27-31 above, and further in view of Frost et al. (US 6,352,754).

Regarding Claim 19, Kavanagh et al. describe a process of making laminates comprising an interlayer between two glass sheets, as described in paragraph 2 above. Kavanagh et al. teach such an interlayer comprising one functional layer and one bonding resin layer, the functional layer containing a solar reflective coating (Abstract; p. 1, L. 28-34). However, Kavanagh et al. do not teach said interlayer having a pre-cut peripheral portion to be later removed. Frost et al. likewise teach a method of making laminates comprising a interlayer between glass sheets, where the interlayer contains a coating for reflecting infrared solar radiation (col. 1, L. 7-28). Said reflective layers tend to corrode when they are disposed extending completely to the edge of the glass plates, eventually causing visual defects in the laminates (col. 1, L. 29-40). Frost et al. therefore teach first making an interlayer of the same dimensions as the glass plates, then cutting the functional layer **5**, **7** thereof via slicing blade **13**, leaving a pre-cut peripheral zone **8** to be removed in a subsequent step (Fig. 2, 3; col. 10, L. 56-65; col. 11, L. 6-12). Frost et al. teach that the resulting margining of the reflective coating protects it from corrosion (col. 3, L. 18-26). Thus it would have been obvious to one having ordinary skill in the art to apply the pre-cutting and subsequent peripheral removal steps onto the process of Kavanagh et al., Balduin et. al., and Mattimoe et al., because Frost et al. teach that these steps are an effective means of preventing corrosion in the interlayer.

Regarding Claims 22, 24, 25, and 36, Kavanagh et al. do not teach a process wherein the shaped interlayer is first positioned over one glass sheet, a pre-cut portion is peeled from the interlayer, and a second glass sheet is then applied to the interlayer. Frost et al. teach that, in a particularly preferred embodiment of their process, the interlayer is first formed with only one layer of PVB bonding resin that will permit assembly thereof with one glass substrate (col. 2, L. 5-9, L. 39-40, L. 49-62). This interlayer **3** is first positioned over one glass sheet **2**, with the PVB resin layer **4** applied to the glass **2** (Fig. 1; col. 10, L. 26-34; col. 12, L. 40-43). The pre-cut peripheral zone is then peeled off (leaving a certain distance between the functional layer's outer edge and the edge of the glass), a second PVB layer is added to the exposed surface of the functional layer, and the second glass sheet is positioned over and applied thereto (col. 3, L. 6-12; col. 4, L. 40-45; col. 12, L. 14-17, L. 55-57). Kavanagh et al. teach that the shape of the laminate's first and second glass sheets should match (p. 12, L. 8-11). Frost et al. teach that this sequence of lamination offers the advantage of allowing less precise positioning of the interlayer with respect to the glass sheets, as an oversized interlayer may be first adhered to the one glass, then incised at a precise distance from the glass edge walls before peeling (col. 3, L. 43-51, L. 55-65). Thus it would have been obvious to one having ordinary skill in the art to apply the laminating and peeling sequence of Frost et al. onto the process of Kavanagh et al., Balduin et al., and Mattimoe et al., because Frost et al. teach that this sequence can produce an interlayer precisely margined with respect to the glass edge walls, without the need for very precise positioning.

Regarding Claim 23, Frost et al. do not specifically teach that the first-applied glass sheet is intended to be at the internal side of the final glass pane. However, one skilled in the art would have recognized that the order of assembly of the two glass panes (i.e. whether the intended internal side of the final glass pane is the first or second glass sheet applied to the interlayer) is unimportant according to the process taught by Frost et al., because the final glass-interlayer-glass laminate will be identical according to either order of assembly. It is also the position of the examiner that the intended use of said one glass glazing in Claim 23 does not add structure to the claim. Intended used of a known compound does not give it patentable weight. See *In re Thuau*, 57 USPQ 324, CCPA 979 135 F2d 344, 1943.

4. Claim 26 is rejected as being unpatentable over Kavanagh et al., Balduin et al., and Mattimoe et al. as applied to Claims 17, 18, and 27-31 above, and further in view of Hoagland et al. (US 5,264,058). Claims 20, 21, 33, 34, and 35 are rejected as being unpatentable over Kavanagh et al., Balduin et al., Mattimoe et al., and Frost et al. as applied to Claims 19, 22-25, and 36 above, and further in view of Hoagland et al.

Regarding Claims 20 and 26, Kavanagh et al. describe a process of making laminates comprising an interlayer between two glass sheets, as described in paragraph 2 above. However, Kavanagh et al. do not teach cold-stamping said interlayer in a configuration substantially corresponding to the end shape of the curved laminate to be made, where, as defined by Applicant, cold-stamping means pre-forming the interlayer at room temperature (see paragraph [052] of Applicant's Specification).

Hoagland et al. teach a process of forming a shaped prelaminate of glass and plastic by thermoforming a plastic interlayer upon a mold, then bonding the interlayer to a contoured glass layer (col. 1, L. 54-62). Hoagland et al. teach initially clamping the plastic layers **62** of the laminate between upper and lower members **22**, **24** of an unheated peripheral clamp frame, giving the plastic layers a configuration approaching that of the glass, before applying the plastic layers to the hot mold for thermoforming (Fig. 1, 6; col. 3, L. 31-39; col. 4, L. 39-48, L. 60-62). Hoagland et al. teach that this initial cold-stamping helps avoid excessive stretch and wrinkling in the plastic layers in subsequent shaping (col. 3, L. 44-52). Thus it would have been obvious to one having ordinary skill in the art to cold-stamp the interlayer of Kavanagh et al. before thermoforming, because Hoagland et al. teach that this cold-stamping prevents defects in the interlayer in later steps.

Regarding Claims 21 and 33, Kavanagh et al. teach applying vacuum to the interlayer, specifically within the chamber **34** between the interlayer **70** and mold surface **27**, to make the interlayer adhere to the mold (Fig. 3; p. 10, L. 19-27). This vacuum is applied before the interlayer's preheating and maintained throughout the thermoforming (p. 11, L. 16-21). Kavanagh et al. further teach an interlayer having a functional layer **12**, **18** and a single outer layer **14** of polyvinyl butyral bonding resin (Fig. 1; p. 1, L. 14-17; p. 2, L. 21-28; p. 5, L. 23-36). Kavanagh et al. do not explicitly state that this interlayer would have its functional layer adhered to the mold surface during thermoforming. Instead, Kavanagh et al. detail vacuum thermoforming for an interlayer with bonding resin on both faces, and teach that this embodiment may require an anti-

stick agent to minimize unwanted sticking of the interlayer to the mold surface (p. 8, L. 8-13, L. 33-37; p. 9, L. 1; p. 10, L. 22-25). It would thus have been obvious to one having ordinary skill in the art to dispose the single-PVB-sided interlayer such that the functional layer, rather than the bonding resin, faces the mold surface, because Kavanagh et al. teach that applying the bonding resin to the mold surface can cause unwanted sticking of the interlayer to the mold.

Regarding Claims 34 and 35, Frost et al. teach positioning the shaped interlayer over one glass sheet, with the bonding resin layer applied to the glass surface, as described in paragraph 3 above.

5. Claim 32 is rejected as being unpatentable over Kavanagh et al., Balduin et al., and Mattimoe et al. as applied to Claims 17, 18, and 27-31 above, and further in view of Charbonnet (US 5,209,881).

Kavanagh et al. teach the use of a thermocouple **50** to monitor the temperature of the interlayer **70** during thermoforming and regulate the heating by feedback control (Fig. 3; p. 8, L. 22-32). However, Kavanagh et al. do not teach an infrared pyrometer as a means of detecting the interlayer's temperature. Charbonnet describes using infrared pyrometers to measure the temperature of resin-containing laminates during curing of said resin, but teaches that thermocouples may also be used for this purpose (col. 2, L. 30-31, L. 48-53; col. 3, L. 19-21; col. 3, L. 51-53). Charbonnet thus teaches that infrared pyrometers and thermocouples are considered functionally equivalent methods of measuring the temperature of a resin laminate during heating. Therefore, it would

have been obvious to one of ordinary skill in the art to substitute an infrared pyrometer for the thermocouple disclosed by Kavanagh et al.

Art of Record

6. The following prior art is made of record: Chabal et al. (US 4,557,776) teach a process for assembling two bent glass sheets with a thermoplastic interlayer (col. 1, L. 11-24). Chabal et al. teach that said assembly should be preheated to soften the interlayer, and that this preheating is accomplished much more efficiently and uniformly via convection than with purely radiant means (col. 3, L. 15-24, L. 67-68; col. 4, L 1-12). Baldridge (US 3,982,984) teaches a process of making a laminated safety glass comprising a polyvinyl butyral interlayer between glass sheets (Abstract). Baldridge teaches that infrared radiant heaters and hot air devices are functionally equivalent heating means, while cool air and chill rolls are functionally equivalent cooling means, at any stage throughout the process (col. 7, L. 9-17). Baldridge discloses using infrared pyrometers to detect and adjust the temperature of the interlayer (col. 4, L. 9-19).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN R. SLAWSKI whose telephone number is (571)270-3855. The examiner can normally be reached on Monday to Thursday, 7:30 a.m. to 5:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan, can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian R. Slawski/
Examiner, Art Unit 4191

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